AVIATION

The Oldest American Aeronautical Magazine

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Air Power afloat—Aircraft Squadrons, Scouting Fleet, anchored off Culebra Island, Porto Rico

Official Photo, U. S. Navy

VOLUME XVI

NUMBER 20

SPECIAL FEATURES

THE STOUT AIR PULLMAN

MODERN RADIATORS FOR AERO ENGINES

THE AIR SERVICE'S CENTRAL AMERICAN FLIGHT

DUPLICATION OF FUNCTIONS IN AERIAL COAST DEFENSE

GARDNER PUBLISHING CO., INC.

HIGHLAND, N. Y.

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PUBLISHER'S NEWS LETTER

The publication of the figures showing the cost of our Government Air Services has brought much praise and also some criticism. The criticism appears to be based on the assumption that if Congress and the public know that we are spending so much for aviation, there will be a cutting down of appropriations. As one friendly correspondent writes:

"However, the shock of my life came when I read your article about the costs of the Air Services. How in the world did you come to do it? If there is one action which would come nearer to preventing any future increases in air appropriations than the action taken by you, I cannot conceive of what it could be, because you played it up to make the case look as bad as possible. Very likely the result will be that next year, instead of $12,000,000 for running the Air Service, it will be $5,000,000, all of which will be necessary for the operation of the Air Service. Therefore, there will be no money left for the aircraft manufacturers."

This letter was not from anyone connected in any way with the aircraft industry, but from a man who looks at the matter from the government point of view. Such a criticism deserves a very frank answer and our readers will naturally be interested in our point of view.

* * * *

During the war, and ever since, civilians have been bitterly criticized for their part in the "billion dollar aircraft scandal." Only last month the Department Commander of the American Legion of New York sent out the following statement to members:

"Over a billion dollars was paid to contractors to supply airplanes and yet not one airplane flew over the Western Front. These debts the Government paid and some people became rich."

General Patrick, in a signed article published in *Current History* of February, 1923, gives the net cost of War Aviation as $383,131,113.50, after deducting the value of fields and usable war stocks on hand. Of this a comparatively small percentage went for the purchase of airplanes in this country.

The point we believe to be of the greatest importance is that since the war the Government has spent about as much for aviation as it did in that supreme effort, and still we are without adequate numbers of airplanes. If the civilians fell down in production during the war period, we believe that the officers who have had the spending of the appropriations should let the taxpayers and citizens know just how they are building up our air defenses. They should tell the restrictions under which they operate. As the figures which we printed were those given to the Appropriations Committee of Congress, we cannot believe that their republication in an aeronautical paper which goes to those who have the best interests of aeronautics at heart can result in halving the appropriations next year. Rather, it will create discussion and show the great need for some constructive air policy, instead of the haphazard methods now in vogue.

* * * *

Concerning increases of appropriations, we feel certain that with the present attitude of President Coolidge and Congress, there is little hope for increased appropriations for aircraft. We certainly do not share in the belief that Congress should be told that $67,000,000 is being spent for aviation while the public is given the impression that it is only $28,000,000, and that Congress will not give enough money to support the services and purchase aircraft as well. It is apparent, with air limitation conferences in prospect, that every country will wish to show that air preparedness is the least expensive and most efficient form of defense. To do this, Congress, the public and particularly those interested in aviation should know how much money is being spent and how it is being used. For this reason AVIATION feels that instead of endangering future appropriations, it has shown how inadequate is our air force and how vitally necessary it is to spend the money that is available to the best advantage.

* * * *

As to making "the case look as bad as possible," we say very seriously that if it had been our purpose to do that, we would not have confined ourselves to the figures and statements made to Congress. We do not believe, in making out a bad case for the Air Service. But we do believe that the facts that are given to Congress by officers should be discussed in the aeronautical press. Our correspondent appears to feel that if appropriations are reduced there will be no money left for the aircraft manufacturers. That appears to be the case at present, with practically all the companies shut down or running on a quarter capacity basis.

* * * *

To put it directly, the purpose of AVIATION for eight years has been to fight for the cause of aeronautics, and to put the interests of the art and science and industry above all other considerations. That all the older of our aeronautical papers have fallen by the wayside indicates that this policy has been sound. And our readers can be assured that regardless of criticism, AVIATION will continue to give them the facts of aviation in as constructive a manner as possible.—L.D.G.

MAY 19, 1924

AVIATION

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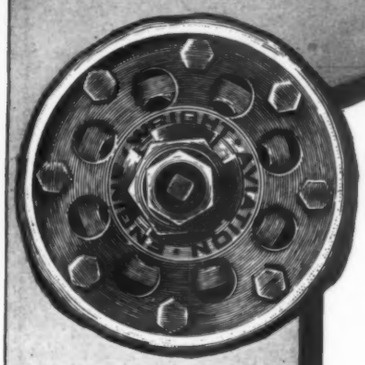

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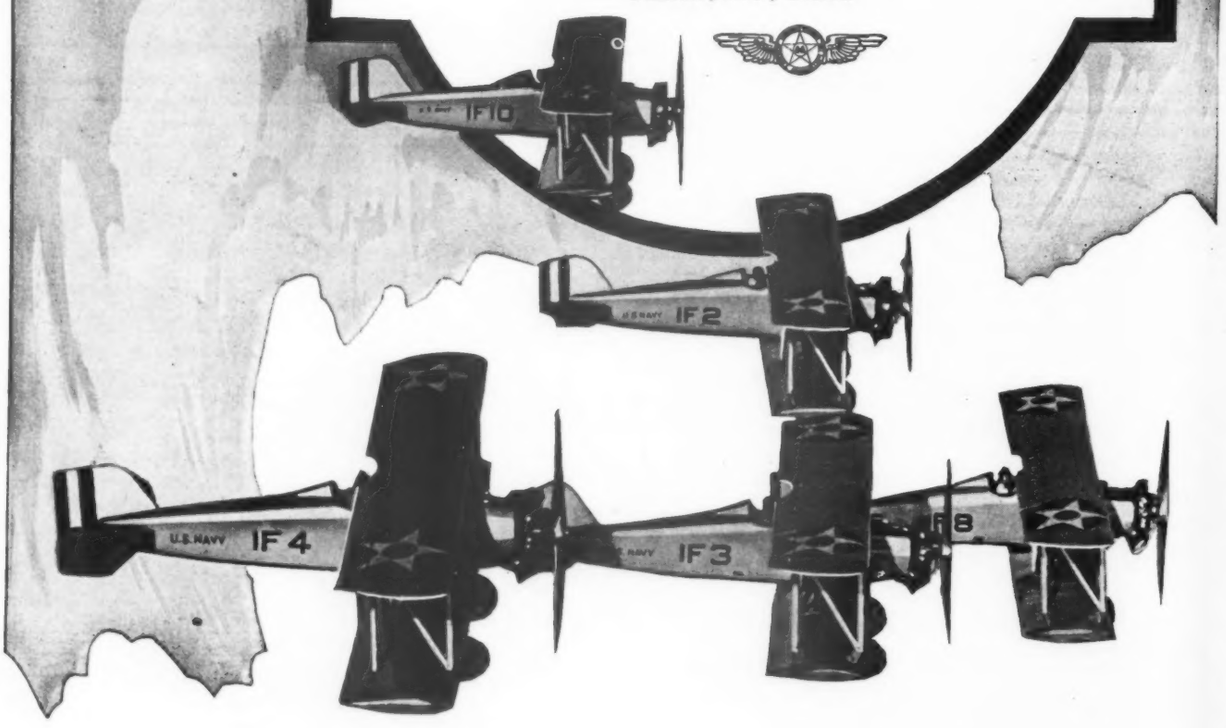

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Aircraft Expenditures

IN line with the recent deductions made by AVIATION regarding the use to which aeronautical appropriations have been put in the last few years two statements have been made recently that have a direct bearing on the matter.

Capt. David S. Seaton, secretary of the Aeronautical Board, which is composed of representative officers of the Army and Navy Air Services, made the following statement before the Appropriations Committee:

"I am afraid the way we are going that our money is going into installations for using aircraft. That is what I am objecting to. Instead of putting in one installation and more aircraft, we are putting in two installations and dividing up our money so that neither one of us is getting enough aircraft to do anything with."

Admiral Robert E. Coontz, Commander of the United States Fleet, in his statement issued last week regarding the material condition of the Fleet, does not lay the blame on the insufficiency of appropriations, but places a considerable part of it on the excessive overhead at Navy Yards, which, he declares, "uses up the money available without putting a sufficient portion of it into ships."

This method of using appropriations is evidently being brought under discussion by the statements continually made by many officers of both Services, when they talk in public, that Congress is to blame for the defenceless condition of the country's Military and Naval Services. Congress has naturally an interest in finding out where the money it appropriates goes, and statements like the above will only lead to further inquiry.

"Constructive Economy" would appear to be one of the probable slogans of President Coolidge's campaign, and the idea will have the hearty endorsement of the country.

That more money is needed for our air defense is obvious from the condition the Air Services are in—but first there should be the best use made of the present funds. When this is settled, then more funds can be asked for and secured with a firm foundation of necessity.

An Important Question

CONGRESSMAN BRITTEN'S Resolution asking the Secretary of the Navy to furnish the House of Representatives with information about the Navy contains a question concerning aviation that seems to be extremely pertinent at this time.

Congressman Britten asks: Is it a fact that America leads the world in the theory and science of aviation, and yet trails behind Great Britain, France and Japan in aeronautical preparedness for national defense?

Whether or not we lead the world in aeronautical engineering and research may be disputed, but if world records are any indication of superiority, then our American aircraft designers can at least have a strong reason for making such a claim.

There can be no doubt that the United States is behind France and Great Britain in actual aeronautical service equipment and in combatant air units. We are not sufficiently informed regarding the organization of the Japanese air services to pass an opinion, but the mere asking of the question would indicate that Nippon is, if not ahead of us, at least catching up rapidly enough.

The real heart of the problem is the lack of modern service aircraft. This is due largely to two causes. First, the indefiniteness of appropriations for this purpose, and second the uncertainty of the officials in charge as to what kind of equipment they want. Millions of dollars have been spent on engineering and research work, so that after five years of this work there should be a definite idea as to what constitutes an up to date service plane under present production possibilities. In other words, it is infinitely preferable to settle this year on a few "excellent" airplanes and put them in production so the squadrons can be equipped with them than to postpone this work until next year in the wholly fallacious hope of getting "a super-excellent" airplane. For then the excellent airplane will have become only "very good" and someone will suggest waiting until the "really excellent" airplane becomes available two years hence. It is obvious that such a policy will never give us modern service aircraft in sufficient numbers.

Major Martin's Return

THE happy termination of the adventure which befell Major Martin and Sergeant Harvey after the Alaskan wilderness had swallowed them up for twelve days is a good augury for the ultimate success of the American World Flight. To have survived a crash into a mountain in foggy weather, and then to have tramped for seven days back to civilization under most severe weather conditions shows a physical and mental hardihood which are typical of the Air Service. Major Martin and Sergeant Harvey have been worthy of the Air Service's "never-say-die" spirit.

A Strong Rejoinder to Come

AVIATION for the lack of space has had to spread over several issues the digest of the House Hearings on Air Service duplication, and in so doing may have appeared to give the Army attack on the Navy undue prominence. This was because the complainants are always given the first opportunity to state their case. The testimony of Captain Seaton which appears in this issue drew the fire of Admiral Moffett and this will be published in the next issue.

Air Service Wants All Aerial Coast Defense

Captain Seaton's Testimony Shows Army Air Service Wants Definite National Air Policy

Capt. David Seaton, Secretary of the Aeronautical Board, followed Maj. Gen. Mason M. Patrick, Chief of Air Service, in stating the claims of the Air Service for complete control of aerial coast defense work at the hearings held by the Military and Naval Affairs Committee of House, sitting jointly.

Captain Seaton was questioned about the allocation of functions of the Army and Navy and the legislation on which it is based. He said the Congressional Act had been suggested by Brig. Gen. William Mitchell.

Need of an Aviation Committee

"The reason given by General Mitchell was that duplication was rampant. He pointed out that both Services were trying to do the same thing; and not so much the same thing, but each Service had functions which the other could very well take over and secure great economy in expenditures by so doing.

"The Law of 1920 states:

"That hereafter the Army Air Service shall control all aerial operations from land bases, and that naval aviation shall have control of all aerial operations attached to a fleet, including shore stations whose maintenance is necessary for operations connected with the fleet, for construction and experimentation, and for the training of personnel.

"When the measure came before the Senate, Senator New said that it showed the need of an aviation committee; that this legislation concerned the Army just as much as it did the Navy, and the Senate Military Affairs Committee had just as much right to report out legislation of this kind as the Senate Naval Affairs Committee, and that the objections by members of the Senate Naval Affairs Committee only proved his contention that there should be an aviation committee to consider these matters.

Duplication of Functions

"In my opinion the committee must look for duplication in functions and not in facilities. I think that the duplication of facilites is but a symptom; the disease lies in the duplication of functions. If you can settle the duplication of functions you will not have to consider the duplication of facilities. (p. 18)

"You may not understand me when I talk of the air; it is comparatively new. Let us talk of big guns. The Germans developed a gun that would shoot 70 mi. Now, we may develop a gun that will shoot 100 mi. Who is going to man that gun—the Army or the Navy? If it is the Navy, are you going to put them there side by side with the Army to shoot their 12 mi. gun, and the Navy to shoot the 100 mi. gun. Are you going to give each of them a machine shop, arsenals, and whatever may be necessary for coast defense guns to function? Are you going to put them there side by side, with one Service to shoot at the battleships that come in to bombard the coast, and the other one to shoot at vessels that attack our coastal shipping? I do not think you would, but that is what you are doing today, because a bombing plane is nothing but a big gun that goes out a hundred miles or two hundred miles at sea. You are putting stations side by side. You are charging the Navy with handling this big gun, this bombing airplane, that goes out and gets the vessel that is attacking our coastal shipping. You are putting the big Army gun, the bombing airplane there in the same post.

The Airplane Knows No Coastline

"I do not mean, of course, that that works in the time of war. But that is the situation you are contemplating. And your duplication does not exist so much at present. It is in the future.

"The airplane does not recognize any coastline. That is no barrier to it, and in a pursuit plane, if you start from the shore line, in a little more than thirty minutes you may be either a hundred miles at sea or a hundred miles back inland. I do not see that an Army officer in an airplane is going to be any less at home a hundred miles or so out over the ocean than your Naval officer is going to be a hundred or two hundred miles back inland.

"It would be all right if only the enemy would obey our division. But that means that when he crosses our coastline, the Navy lays off and the Army goes up to get him. If he would just confine himself to stopping when he got above the coastline, and let the Navy fight it out with him, then it would work all right; but you can readily see that you have still got duplication. If an airplane can defend Schenectady (The General Electric Co.), the same airplane can defend Boston or the shipping within a hundred miles out from Boston. Now, why do you put two airplanes there, one of them to fly over water and one of them over land?

Who Should Defend the Coasts?

"The remedy lies in the assignment of functions in coast defense to either the Army or the Navy. One should have this function and I think it is for Congress to decide which should have this function. If you give it to the Navy, I cannot but see that it takes the coast artillery along with it because Army airplanes must be on the coast to serve the sea coast artillery. The same observation plane that is going to spot the fire when a target comes within reach can just as well be out looking for that target; but at present we do not permit it to go out. It must stay on shore and do nothing, practically, and the Navy goes out and looks for the target.

"It is not so simple a matter as I may indicate to give it to either one or the other Services. If I can convince you of the necessity of doing it, I feel that I shall have done good work.

"I am afraid if you begin to give the Navy coast defense functions you are getting back to what Admiral Mahan would call a 'fortress Navy.' I think that the Navy should have all the aviation that they can possibly put with the fleet; I mean the sea-going fleet.

"Here is the whole proposition: We have an Army policy today and we have a Navy policy, but I do not think we have an Air policy. The only attempt that one ever made to lay down one does not seem to have gotten us anywhere.

Our Present Air Force

"Now what have we? We have four Bombardment Squadrons and four Pursuit Squadrons. That is all we have to defend twenty coastal states. We have not any air force and I do not think that we begin to realize that the time may come when it is going to be more important that we have an air force in readiness when war comes than that we have a Navy when war comes. I am afraid the way we are going that our money is going into installations for using aireraft. That is what I am objecting to. Instead of putting in one installation and more aireraft, we are putting in two installations and dividing up our money so that neither one of us is getting enough aireraft to do anything with.

"I think our Navy is still our first line of defense. I think the Air will be. The British system is to give to the Army certain air force they need for permanent assignment, and to give the Navy certain air force, and to maintain intact, if possible, her air force independent of both services. It is upon the Air Force that Great Britain primarily depends for her protection."

Secretary Roosevelt Gives His Views

The Navy point of view on the duplication of functions was given in general terms by Assistant Secretary of the Navy, Theodore Roosevelt, who said:

"I agree that we have not properly developed our defense

from the standpoint of aviation in this country and that we do need more money appropriated in both branches of the Service to develop it properly. From that on I begin to disagree.

"I do not believe it a good thing to make a total assignment of defense of the coast to either the Army or the Navy. I do not believe in seeing the Navy given the entire defense of the coast. I do not believe in seeing the Army given the entire defense of the coast. I think the question has got to be handled largely through coordination and liaison between the two branches of the Service. In my opinion it is really necessary to have some duplication of functions in the two branches. I think we are making good progress in liaison and in coordination between the Services, particularly along the lines of aviation.

"I would favor working for a period as we are until we get our ideas a little more definite and clarified. I am of the opinion that the Navy should have the duty of protecting coastwise shipping. Let us suppose we are informed that there is a squadron of enemy cruisers coming down the coastal lanes. The Navy gets that information and mobilizes her various arms of defense to meet it. She should immediately communicate the full details to the proper Army officials and they should join forces to meet the enemy.

"I have always thought it possible to coordinate the two Services in the training of personnel and in experimental work. If you consolidate both, and put them under one branch of the Service, it is apt to atrophy the endeavor toward developing planes for the other branch. Summing up, it is my judgment that it would be better to let the General Board formulate policies and endeavor to perfect them and then possibly be able to come back to Congress within a year or two with definite, sound recommendations."

The Aircraft Expenditures

Editor, AVIATION:—

It is certainly true that the large amount of money now being spent for aviation should be handled with the utmost discretion, the same as would apply to a program involving large expenditures for anything at all. There does not seem to be any royal road or panacea to governmental expenditures for aircraft any more than there is for a man's food and clothing. "Intelligent omnivorousness" perhaps is the most definite thing that can be recommended as a general policy. We need to keep abreast in the fields, ground equipment, trained personnel, service machines, engineering and research, all in proper proportion to the whole. To balance these different factors is simply a matter of judgment, taking into account of course that in war time the item of personnel and equipment for actual service is of paramount importance, while in peace times new development work is probably the more important.

At first sight the amount expended on aviation during the past year may seem out of proportion to the results obtained, but it is probably more apparent than real because of the difficulty of properly appraising the many reasonable but "unsuccessful" experiments that have been made. Nevertheless, there are undoubtedly factors which at the present time hinder the exercise of proper judgment in these matters.

First and foremost I should put the multiplicity of governmental organizations which have to do with aircraft. Directly or indirectly these include the Army, Navy, Post Office Department, National Advisory Committee, and Bureau of Standards. There are many functions, particularly concerned with development work, which overlap all five of these organizations, and there is no effective clearing house by which unnecessary duplications may be avoided. The Post Office probably gets more for the money expended than any of the others. One of the principal reasons is that they handle all their development work on the outside; which brings us to the next factor of governmental operated laboratories and shops. It seems to me that the spirit prevailing in these government plants today is very much better than formerly, as they are apparently trying in most cases to be of service to the industry generally, but it is still an unsound state of affairs when the very men who are supposed to be the judges as to the award of the contract for design or construction are also trying to get it for themselves. I don't impugn their motives, which are not at all mercenary and arise purely from pride in the Service and a personal ambition to enlarge one's field of activities, both admirable in themselves, but in this misapplied.

It seems to me that the closer the government plants can be held to purely scientific lines of research and necessary control of outside contracts the better it will be for the industry as a whole.

It has usually been recognized as a matter of principle that new developments along untried lines, (as well as economic production), can be much more effectively handled by private initiative than under strict governmental control. The trouble with the present arrangement is that not only government agencies themselves try to handle a great part of this work, but there are serious business restrictions which prevent a private concern from reaping its just reward out of the technical contributions which it makes. I understand there is considerable force of opinion now in favor of the British plan which guarantees any originator of a new idea a proper recompense irrespective of who gets the contract for utilizing it.

Coming down to one of the specific questions that you raise in your last issue as to the cost of helium, I am inclined to agree with you that in spite of the large potential value of our helium resources it might be best not to sink so much money in it until there is a chance for working out some of the fundamental questions as to its ultimate availability and range of utility.

RALPH UPSON
Detroit. May 8, 1924

Less Research and More Aircraft

Editor, AVIATION:—

I read the article on 1923 Air Services expenditures with considerable interest. While I had never taken the time to compile the figures in the manner presented, I cannot say that the totals were entirely a surprise to me. For the past few years I have felt that much of our criticism of appropriations was not quite justified and that the fault lay rather in the utilization of the funds than in the amounts allotted by Congress for aeronautical purposes.

This undoubtedly represents a most unusual statement for one connected with the industry, but I think that it is justified by the figures. I also consider that you rendered a most valuable service to the interests of National Defense in compiling the totals in your recent article. This publication is certain to be productive of good results.

There has constantly impressed itself upon my mind the thought that some lack of balance existed between the amounts spent for research, for experimentation and for actual production. It has appeared to me, for some time, that the research facilities and the experimental equipment of the Government had not suffered a post-war reduction bearing any semblance of proportion to that which took place in the production side of the industry. The result of pursuing this policy for the past several years has enabled us to make some amazing technical advances, but has left us with pitifully inadequate military equipment. In other words, we seem to be in the position of possessing all of the information but none of the aircraft!

In view of the peculiar international conditions existing during the past few years I will admit that there *may possibly* have been some logic in the policy pursued from November, 1918, up to date. Without regard to the right or wrong of this policy, I am convinced that it is now time to make some radical changes. So much research and so much experimental work have been completed that designers have barely had time to assimilate available data and we would lose nothing by a drastic change in policy. I, therefore, believe that a very radical reduction should be made in expenditures for research, experimental construction and particularly for the operation of Government plants, etc. Such a shift in policy would release substantial sums for application to production of the types of aircraft developed to date. We would thus be able to provide adequate military equipment without any increase in the expenses of the Government.

It seems to be on the cards that any revision of Government expenditures in the near future will be downward rather than otherwise. It, therefore, behooves us to work out a saner balance between expenditures for research and for production.

ARCHIBALD BLACK
Garden City, L. I. May 5, 1924

An Omission

The article "National and International Air Legislation" by Powell Crichton, which appeared in April 21 and 28 issues of AVIATION, was originally delivered as a lecture to the class in Aeronautics at New York University. Owing to a regrettable oversight this was not stated at the time.

Airway Pilots' Salaries

How Pilots of Commercial Transport Airplanes are Paid in England, France and the United States

A serious disagreement between the British airway pilots and the Imperial Airways, Ltd., in which are merged the four former British air transport companies, has held up since April 1 the operation of British air lines from London to the continent. There has not, properly speaking, existed a strike, for when the four old airway companies went out of existence on March 31, the engagements of their pilots automatically terminated. The trouble started when the new concern, the Imperial Airways, attempted to hire the old pilots according to a new system of pay.

What the British Pilots Want

The Imperial Airway's original proposals provided for a basic pay of £100 (approx. $450) per year with a flying pay of 2 pence (4 cents) per mile. A few senior pilots would be paid £200 per year. The company did not offer a year's contract, as the old firms had done, the new terms being subject to one month's notice.

The Federation of British Civilian Air Pilots, on the other hand, asked for a basic pay of £500 (approx. $2,250) per year; a flying pay of 10 shillings ($2.40) *per hour* flown, with 200 hr. flying guaranteed per year; £25 increase in the basic pay for each 500 hr. of flying; a contract for twelve months; and £1,000 insurance for death and benefits. The Federation pointed out that almost half of the pilots concerned had been receiving a basic pay in excess of £500 per year from the old companies, and that two of these—Handley Page and Instone—increased this pay at the rate of £50 for each additional 400 mi. flown. Under the new arrangement these pilots would lose the benefit from flying hours accumulated toward their next increase in basic pay. It was also stated in the English press that Handley Page pilots had been making about £915 per year, Instone pilots £857, and that Daimler pilots had been earning on an average of £1,100 per year.

What They Are Offered

The Imperial Airways thereupon offered a substitute arrangement providing for a basic pay of £400 per year for the first year, with an increase of £25 for each of the following four years, and a flying pay of 1⅜ pence per mile. Under this arrangement it was estimated that an airway pilot's total pay would vary, according to seniority, from £755 to £855 per year if he were flying an average of 2 hr. a day at 85 mi./hr.

The Federation has not yet accepted this proposal, and the situation has been further complicated by the objection some of the pilots have against the new management. One important point the pilots are complaining about is that under the new arrangement their right to decide not to fly in bad weather conditions or on machines they feel they cannot trust would be interfered with by the company. Furthermore, mechanics flying in the airway planes as "flying mechanics"—in which capacity they act to a certain extent as assistant pilots—would not be paid specially for this service, whereas the old companies paid them at the rate of 2 shillings per hour.

Dispute not yet Settled

The British Air Ministry has endeavored to bring about a settlement of this dispute, but so far without any success. In the meantime the British airways are idle, and the big Easter rush of passengers and merchandise for the continent was entirely accommodated by French and Dutch aircraft.

French Airway Pilots' Pay

The pay of the French airway pilots averages from 30,000 to 40,000 francs per year, which at the present purchasing value of the franc in France may be considered as equivalent to about $3,000-$4,000, although at the current rate of exchange it would give much less in this country. The pay consists of a basic pay, which is generally between 800 and 1,000 francs per month, and a flying pay which averages 0.60 francs per kilometer flown (about 1 franc per mile). Contracts are made for one month only.

Some interesting details are given in a recent issue of *L'Air* regarding the system under which pilots are paid by the Franco-Roumaine Company, which operates the Paris-Warsaw and Paris-Constantinople airways.

A Complicated System

This pay consists of the following:

(1) A basic pay of 1,000 francs per month;

(2) A flying pay varying in accordance with the nature of the ground flown over, the length of the route, etc.: for instance on the Paris-Strasbourg route flying pay is a flat rate of 100 francs for single engined planes in day service, and 240 francs for three engined planes in night service;

(3) An increase in basic pay proportional to the seniority (total flying time) of pilots, who are divided into six classes for this purpose; this increase is 25 per cent for first class pilots with from 1700 to 2000 flying hours, and 15 per cent for sixth class pilots, having from 1100 to 1200 hr. of flying;

(4) An increase of 8 per cent in basic pay for pilots holding a ground engineer's certificate;

(5) An increase of 5 per cent for pilots holding a second class navigator's certificate;

(6) An increase of 10 per cent for pilots holding a first class navigator's certificate;

(7) An increase of 5 per cent for pilots holding a radio operator's certificate;

(8) A compensation pay in case of sojourn in foreign countries to take care of the high cost of living caused by the varying rates of exchange.

Our Air Mail Pilots

It is interesting to compare the foreign airway pilots' salaries with those paid by the U. S. Air Mail Service. Here the pilot receives a basic pay of $2,000, and a flying pay which varies from 5 cents to 7 cents per mile flown. The 5 cents rate applies to the Central Division, from Chicago to Cheyenne, where the country is generally flat; the 6 cents rate to the Eastern Division, from New York to Chicago; and the 7 cents rate to the Western Division, from Cheyenne to San Francisco. Both of the latter divisions cover routes which are very mountainous. The rate of flying pay for the night flying service from Chicago to Cheyenne, which will be inaugurated July 1, 1924, has not yet been announced by the Post Office Department.

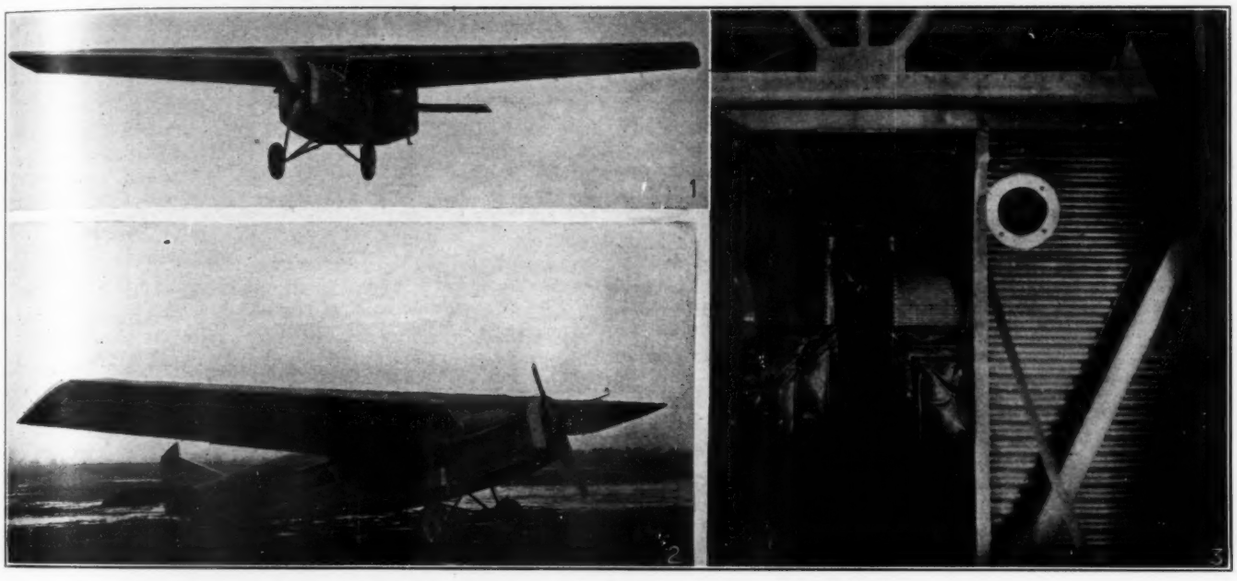
If due allowance is made for different living conditions and the purchasing power of the various currencies, it will be found that the pay of airway pilots is essentially the same in Great Britain, France and the United States.

The Stout Air Pullman

America's First All-Metal Commercial Plane, Built in Detroit, Passes Successful Flying Tests

The Stout Air Pullman, Detroit's first bid for commercial aviation, has just completed its test at Selfridge Field, under the guidance of Walter E. Lees, the well known test pilot of the Johnson Airplane & Supply Co. of Dayton. Fitted with a 400 hp. Liberty engine, the plane carried a useful load of 2379 lb., and climbed 5000 ft. in 12 min., making with this load a speed of 116 mi./hr. in straightaway flight. In the useful load are included a pay load of 1280 lb. and fuel for 4 hr. flight.

The fundamental requirements of the design were safe and profitable air transport. To this end no attempt was made to follow military design in any way, nor to build from old war-stock material for reasons of economy. The Stout Air Pullman, as it is called in passenger form—or the Air Truck in express or mail form—is specially designed for commercial aviation and embodies some of the latest refinements in airplane design.



The Stout Air Pullman (400 hp. Liberty engine)—1. In flight. 2.Three-quarter front view. 3. Internal view of cabin, showing metal construction. The clean lines of the ship are particularly noteworthy

The size of the plane has been chosen to fit the greatest range of commercial use and the greatest variety of fields possible with present day conditions, taking it for granted that money-making aviation must start with things as they are, and not as they will be or should be.

Accommodations

The Air Pullman is a seven-passenger-and-pilot cabin transport designed for air line work. The major items of design were laid out for the most possible hours per day in the air, with all assemblies and units so arranged that they may be instantly inspected and quickly replaced. It is stated that it is possible to change the complete engine unit and fit a new one ready to start in less than one-half hour.

The passenger cabin is equipped with six deep upholstered seats and with plenty of leg room for the tallest of passengers. At the front of the cabin in plain sight of the passengers are mounted an air speed indicator and an altimeter. For long trips the two rear seat pairs fold together to form benches on the side facing each other, with card table or dining table arranged between. Meals can also be served on this table from a small galley arranged at the rear of the passenger cabin, where the foodstuffs will be kept.

Forward of the passenger compartment are two partitions about 3 ft. apart, enclosing a toilet and washroom. From this room one can reach overhead to the baggage hold, situated out in the wings. From here also the gasoline tanks can be inspected and every part of the gas system up to the dash board inspected or repaired while in the air. Tanks are so arranged that in filling with gasoline no fuel can possibly be spilled into the wings.

Forward of the washroom is the pilot's cabin, which has side by side seats and dual controls, and is fully equipped with all navigating instruments and map equipment. This cabin is large enough to stand up in. The pilots' windshield forms a part of the leading edge in such a manner that it contributes to the lift. The sides of the pilot's cabin are entirely left open and pilots who prefer may fly out of doors. Swinging windows are arranged however, so that this compartment can be entirely enclosed, heated and ventilated.

Construction Features

The plane is entirely constructed of duralumin in corrugated form. The wing unit is divided into three sections. The center part is fastened onto the fuselage by six large bolts to the three main spars. The two outer wing sections are detachable for shipping and transportation purposes or for replacement in case of damage.

A wing of thick section is used, the main spar being almost 3 ft. deep on a chord of trifle over 12 ft. at the center. The fuselage hangs below these wings, and is fitted with semicircular windows which swing on a pivot to give one an unusual view in the air. Even the pilots have perfect vision in every direction except up and to the rear, but they can see the horizon in every direction, can see their own landing gear and practically every part of the plane from the pilot's seats.

The engine is muffled by running exhaust pipes back along the side of the ship almost to the tail. These pipes are constructed of duralumin and drilled for a gradual muffling effect. For winter work openings to the cabin furnish heating plenty even for flying in zero weather, while summer cooling is obtained by perfect ventilation of open windows.

Very solid doors between the passenger compartment and

the pilot's compartment form two bulkheads, while the dashboard forms a third door between the passenger compartment and the engine, so that very litle engine vibration or sound gets back to the passengers.

The passenger compartment is also enclosed to prevent noise from travelling back to the cabin and further conflict from the mechanical noises of the engine.

The engine installation is very accessible. The base of the engine mount fastening to the fuselage is extra wide giving great rigidity to the installation and at the same time placing the structural work far enough from the engine itself so that one can reach in and get at everything.

Power Plant

The engine is a standard Liberty 400 hp. model but fitted with a new intake manifold which is the latest development of the Air Service. New heavy timing gears have also been fitted, and the new type jump-gap "Delco" distributing system.

The generator is wound for 12 volts for a large battery which not only takes care of ignition but a Bijur electric self starter with which the plane is fitted, the foot button and controls being between the pilots so that either one can operate the engine.

A gasoline system includes two all-aluminum tanks of 75 gal. capacity, each placed out in the wings 12 ft. apart and well above the engine so that gravity feed is used without the complication of pump or air pressure. All gas lines are flexibly joined with metal connections inside the rubber hose to prevent any parts working in. All gas lines in the engine unit are wound with tape and shellaced to prevent vibration.

The water system with radiator and shutters is a unit with the engine mount, as is the entire oil system. The oil tank is supported under the engine just forward of the pump with a line running forward to join with a copper pipe which runs through inside the bottom part of the water radiator giving about 4 ft. of pipe inside the water. In this way the oil is warmed in winter and cooled in summer to an approximate engine temperature.

Landing Gear

The landing gear is of the divided type, with no axle or cross tube to catch on weeds or brush and thus make trouble. The wheels have an 8 ft. spacing and spring individually with 12 in. of spring action on top of the cushioning of 8 in. tire of 36 in. diameter. The shock absorber cords are arranged externally on the fuselage at the top of the chassis tubes, and work with a sliding guide plate.

The landing gear design is one of the reasons for the extreme softness with which this plane alights.

The plane will be made with either wheels or floats, depending on the service in which it is to be used.

Provision for Mails and Freight

The plane is particularly designed with reference to the carrying of air mail along with express matter, a spacious compartment for mail being provided. With a load of one ton the plane will make approximately 5 mi./gal.

The Stout Air Pullman is an enlargement of the Stout Air Sedan, which this firm used last summer in passenger work flying over 3000 mi. without an accident of any kind.

The Stout Metal Airplane Co. is not planning the sale of these planes irrespective of purchaser, but will only dispose of them to operating concerns under a licensed operating plan. In this manner the constructors hope to protect their equipment from mis-use in dangerous or questionable ventures.

CHARACTERISTICS OF THE STOUT AIR PULLMAN

Span	58 ft. 4 in.
Length (overall)	45 ft. 8 in.
Chord max.	12 ft. 10 in.
" min.	7 ft. 9 in.
" mean	10 ft. 6 in.
Height (at rest)	11 ft. 10 in.
Wing area	600 sq. ft.
Wing tip clearance	9 ft. 11 in.
Horizontal tail area	75 sq. ft.
Vertical tail area	37 sq. ft.
Engine	400 hp. Liberty
Wing loading	9.85 lb./sq. ft.
Power loading	14.8 lb./hp.
Total weight	6017 lb.
Weight empty with water	3638 lb.
Useful load	2379 lb.
Fuel	140 gal. (843 lb.)
Oil	96 lb.
Pilot	160 lb.
Pay load	1280 lb.
Duration at max. speed	4 hr.
Max. speed	116 mi./hr.
Min. speed	53 mi./hr.
Rate of climb at ground	500 ft./min.
Service ceiling	10,000 ft.
Absolute ceiling	12,000 ft.
Time to 5,000 ft.	12 min.

A Pioneering Flight through Central America

Navigation Log of the Army Air Service's Flight from Panama to Guatemala

The Army pilots from France Field, Panama Canal Zone, who left that field on Feb. 4 last on a flight to Central America, returned on Feb. 26 after an exceptionally interesting and successful trip. The expedition was especially noteworthy when it is considered that this flight covered an area hitherto unknown from the air and that the landing fields were not all that could be desired.

The Personnel

The following officers and enlisted men made up the flight personnel: Maj. Rayeroft Walsh, Capt. A. W. Smith, Lieuts. L. L. Beery, P. Wainer, L. W. Miller, F. P. Albrook, Sergts. L. R. Crevier and R. Roesser.

Lieutenant Beery, Navigation Officer of the Flight, submitted the following official report from the navigation standpoint of the expedition:

All references to distances, landmarks, etc., in this report are based upon the Rand McNally standard map of Central America. Distances given are only approximately correct. No compass courses are given for the reason that most of the country flown over was very mountainous and it was found best on almost every leg of the flight to make detours around the highest ranges and peaks rather than to fly a compass course. A German contour map of Central America, prepared by Alfredo Vischer and copyrighted by Wilhelm C. Rubsamen, Stuttgart, was found to be quite accurate and can be profitably studied in connection with the Rand-McNally map.

Mountains the Map Missed

The first leg of the journey from France Field to David, Panama, via Chame Pass, is approximately 225 mi. and is not difficult. Starting from France Field, the course is almost due south across Gatun Lake, keeping the right arm of the lake well to the right. Twenty-five minutes should bring an airplane to Chame Pass, which is really the end of the Veragua Mountain Range. Traverse the pass and turn sharply to the right along the main range of mountains to within 10 min. of David. On a clear day it is possible to see a small but extremely flat-top mountain some 30 to 45 min. before reaching David. This mountain is not marked on the map, but is easily recognized and makes a good landmark to fly by, as David lies just a little to the left and a few miles beyond same. The field is privately owned, with no mechanics or hangars, and is situated between the town and the ocean. It is approximately sea level and is good for all types of planes. The airline route down the Atlantic Coast is some 40 mi. shorter than the Pacific Coast route, but the latter is better

because on the Pacific side the country is fairly good for forced landings for at least half the distance, while on the Atlantic side there is not a possible landing field on the entire flight. Also, 3000 ft. of altitude is all that is necessary on the Pacific course, while on the Atlantic course the Chiriqui Mountains, which must be crossed at the latter end of the flight, are 7000 to 8000 ft. high, with isolated peaks much higher, and the entire range is cloud-capped almost every day in the year. Finally, the Atlantic course has twice the annual rainfall that the Pacific course has, and during the entire rainy season, which lasts eight months of the year, the Atlantic course is usually very wet.

From David to San Jose

From David to San José, Costa Rica, a distance of 160 mi., it is best to bear to the left or south of the airline course out over La Concepcion, slightly to the right or north of the Gulf of Dulce, and strike the coast line at Coronado Bay. Follow the coast line from here to the Purris River, then turn sharply to the right and follow up the valley to San José. If the weather is clear, leave the coast at Quipos Point. The valley is highly cultivated, and there are a large number of towns; so care should be taken to select the right one, which is situated a little distance from two huge and majestic volcanic peaks and well to the right hand side of the valley going up. The field is long and narrow, but lies with the valley and the wind always blows either up or down the valley. It is a sort of public playground just on the edge of the town, and is the first thing to be seen on approaching the town from the south and west. There are no hangars or mechanics on the field. Do not land on the golf course, which is just to the right of the field as you approach from the south, as it is very rough. The elevation is 2800 ft. and a good landing can be made thereon by all types of planes. On some days, however, the air is quite rough. No chance to land on this flight except very near San José and very near David.

It is approximately 300 mi. from San José to France Field direct, and on the return flight the Martin Bomber made the trip in 3 hr. 30 min., but this route is not recommended for general use, as there is not a landing field in the entire 300 mi., and rain and bad weather are much more frequent over this route than by the way of David.

Bad Flying Country

Flying from San José to Managua, Nicaragua, a distance of 215 mi., it is possible to get through a pass near San Ramòn at an altitude of about 5500 ft. and go up the inside or direct route, but the air is likely to be unusually rough in the pass, and there is much danger of rain or low clouds. The country is very bad all the way up to Lake Nicaragua; so as a general rule it is best to pick a course between the Tilaran Mountains and the Gulf of Nicoya up over Liberia to Salinas Bay which route takes you over a little open country. From Salinas Bay bear over toward the shore of Lake Nicaragua, and from around Rivias on up to Jinotope and Masaya will be found some good country, and so on up to Managua. There are two active volcanoes on Ometepe Island—the first ones seen on the trip—and another small but very active one—not shown on the map—on the course and about five minutes from Managua. The field is on the west edge of the town and is privately owned, having no mechanics and no hangars, and is entirely too small for anything but DH's and light training planes to use with safety. It is approximately sea level, but only 1100 ft. in the clear, and the take-off is over the town. Even a DH with extra gas tanks, or otherwise heavily loaded, would have trouble. Pursuit planes and bombers should stay out.

A new field should be located and established here or at Leòn, which is a larger city than Managua, located in much better country and approximately half way between San José and Guatemala City.

Salvador Has Good Field

From Managua to San Salvador, a distance of 225 mi., the course follows the line of least resistance between the mountains and the shore line, and over very good country as far as the Gulf of Fonseca. A 30 min. flight across the mouth of the Gulf brings one close into a low range of mountains along the Salvadoran shore line. After passing the end of this range, leave the coast line to the left passing over Usulutan and Zacatecoluca, both of which are in fair country, but after leaving the latter place it is very rough, with high peaks to the right. From 5000 ft. altitude at this point Lake Llopango can be sighted, and the landing field is located at the west end of this lake, some 7 mi. from the city of San Salvador. The field, which is owned by the government, is fair for all types of planes now and is being still further enlarged and improved. It has four small hangars located on one corner, and a guard and a small force of mechanics (mostly Italians) are maintained there at all times. The altitude is about 2200 ft.

Dodging a Dead Volcano

The shortest flight of the trip, 110 mi., from San Salvador to Guatemala City, Guatemala, is in some respects the most difficult, as it is necessary to make 8500 ft. altitude to clear safely the mountains near the end of the trip, and there are fewer natural landmarks. In cloudy or rainy weather it might be best to follow the shore line to Istapa and then follow the railroad into Guatemala, but it is almost twice as far. The weather being fine, however, the flight up and the return flight were both made direct. San Salvador is located at the base of a dead volcano, not shown on the map and, unless a pilot is in a very fast climbing plane, it will be necessary to pass around either to the right or the left. Going to the right is slightly nearer the course, but the left takes one over the city. After passing this obstacle, change the course slightly to the right or left, as the case may be, and continue on up the valley in the general direction taken by the railroad, passing between Santa Ana and Lake Coatepeque, which is marked on the map but not colored blue like all the other lakes. From this point can be seen a mountain peak or volcanic cone, which is not as large as some of its neighbors and not marked on the map, but which can be recognized easily because of its perfect proportions, looking somewhat like a huge chocolate cream. This peak is directly on the course, and after passing over it steer just to the left of Lake Ayarza, which lies deep in the mountains and is hard to pick up from any distance without considerable altitude. After passing this lake continue on over the left shoulder of a high range of mountains, and Guatemala is below, lying white in the valley some five minutes away. Volcanoes Agua, Fuego and Acatenango, situated a little to the left and beyond Guatemala, are the most imposing group of peaks sighted on the entire flight. On a clear day they can be seen at least two-thirds of the way to San Salvador; so that if the pilot gets their position relative to the city fixed in his mind, they are excellent landmarks to steer by either on a direct course or flying up the coast line. The field is located on the southern edge of the city near a race course. It is used by the government for a flying field, and a small force of mechanics is available, but their value is doubtful. It has an altitude of almost 5000 ft. and is ample for all types of planes.

Up to the Mexican Border

A flight was made on up toward the Mexican border as far as Quezaltenango, and conditions going up the outside route between the coast line and the mountains were found to be about the same as the rest of the trip. Easy flying over fair country, but on the inside by the direct route the mountain ranges mount up to 10,000 and 11,000 ft. with isolated peaks much higher, and the terrain looks very uninviting. Quezaltenango is located in a large valley or mountain basin at an altitude of 8000 ft. with much flat and highly cultivated country adjacent. A good landing field could be established, but a landing is not advisable with the fields in their present condition.

The following is a time log of the trip for the Martin Bomber which, owing to the load carried and the excessive amount of climbing on many of the flights, averaged around only 75 mi./hr. airspeed for the trip. The difference in time up and back is due principally to the fact that the wind was usually helping us on the trip up, and we bucked a strong headwind on a number of flights on the return journey.

From France Field on flight up—to David, 2 hr. 40 min.; to San José, 2 hr. 40 min.; to Managua, 2 hr. 45 min.; to San Salvador, 2 hr. 45 min.; to Guatemala, 2 hr. Return trip—from Guatemala to San Salvador, 2 hr.; to Managua, 3 hr. 45 min.; to San José 3 hr. 45 min.; to France Field, 3½ hr.

Modern Radiators for Aeronautical Engines

The New Lamblin Radiator Described

Radiators for aeronautical engines, while in principle identical to those used on motor cars, have to answer certain requirements which are peculiar to aircraft operation. These requirements are light weight, minimum encumbrance, good streamline form and sturdiness.

Requirements of Airplane Radiators

The heat generated by a modern airplane engine, which the radiator must evacuate into the surrounding air, is equal to from seven to ten calories per minute of effective horsepower. The average volume of circulating water equals approximately one quart per horsepower minute. The radiating capacity of a radiator is dependent on numerous factors. Generally speaking, it varies in proportion with its surface area, the nature, size and polish of the metal employed, its permeability to air, and the speed of the air stream and its ability to flow off undisturbed. Furthermore, the radiating capacity varies with the density of the surrounding air; with the difference in temperature between the surrounding air and the radiating water; and finally, with the ratio of the cross section of the tubes and the speed of flow of water and air. This brief enumeration, when considered together with the modern high speed engines for airplanes, will give the reader an idea of the difficult problems involved in the construction of airplane radiators.

The three principal types of radiators used with aeronautical engines are: (1) the wing radiator; (2) the streamlined and fin type radiator; and (3) the honeycomb radiator.

The wing radiator is an American development which has given a striking proof of its excellence in last year's Pulitzer Trophy race, where both the Curtiss and the Wright racers were so equipped. This type of radiator was described in these columns at the time, and is, besides, too well known to require any elaboration.

The streamlined or fin type radiator, invented by the Lamblin Company of France, although widely used in Europe, is little known in this country, so that a description of this important accessory will prove of interest.

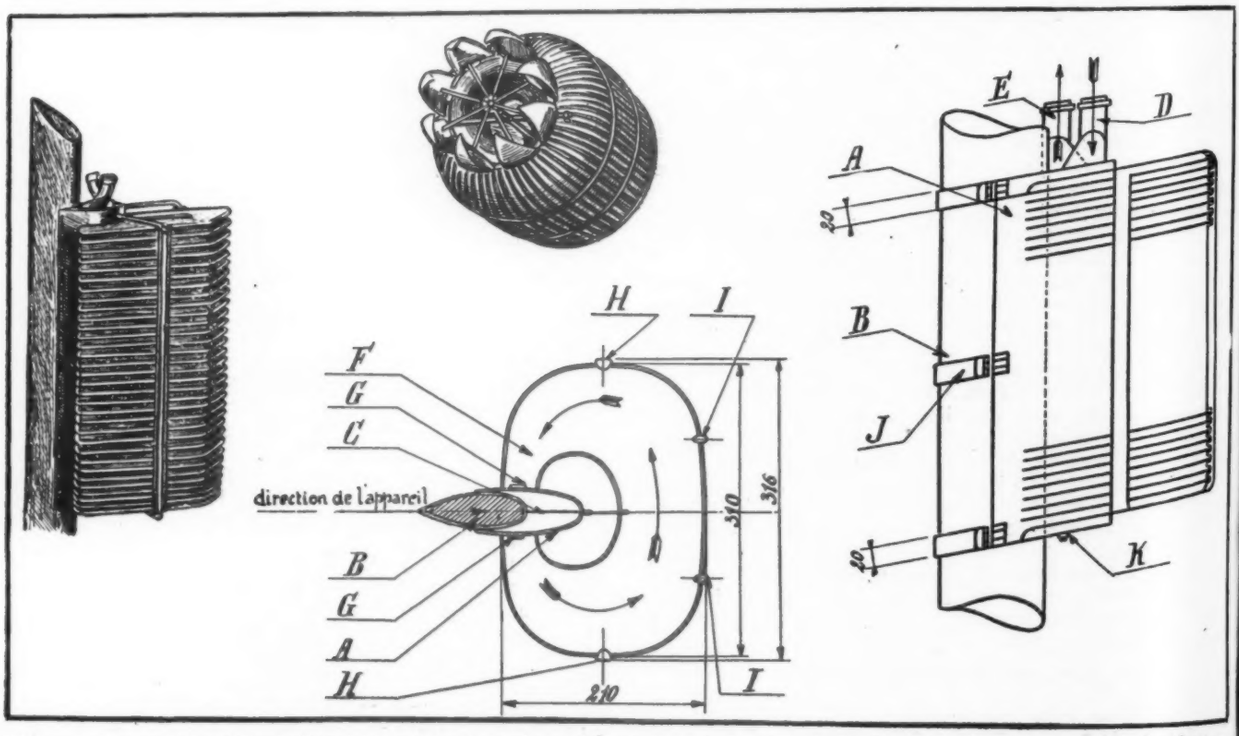
The original Lamblin radiator (1922 model) was, roughly, egg shaped, and consisted of a series of fins which were radially arranged around the two water manifolds, to which they were soldered. The fins were built of thin copper sheet and were braced to each other to insure rigidity. A second series of radial fins was arranged internally, but this was dispensed with on the 1923 model. Instead, the front manifold was equipped with a shutter control consisting of eight mechanically operated segments, whereby the volume of air stream can be controlled by the pilot. (Fig. 1). These changes increased the radiating capacity by about 25 per cent, while the weight remained the same.

It was with these types of streamlined radiators that the principal aeronautic performances and world's records were made by French and other aviators in Europe. Sadi Lecointe used Lamblin radiators in his repeated world's speed records and also in his world's altitude record. Other noteworthy performances to the credit of the Lamblin radiator were the Italian Grand Prize, the 1923 Coupe Zenith, the French Air Transport Competition, etc.

The 1924 Lamblin Radiator

As a result of the experience gained through the operation of these radiators, the Lamblin Company produced toward the end of 1923 a fin type radiator which is based on a totally new principle and which has given very promising results.

The 1924 Lamblin radiator (Figs. 2, 3, 4) consists of a manifold *A* which is fixed to the front of a wing-spar, or of a strut *B* of the landing gear. The manifold is divided into two parts by a partition *C*; the inlet- and outlet-pipes for



Different types of Lamblin radiators for aircraft engines—The top center sketch shows the streamlined type, with the shutters open; the other sketch and the two diagrams show the new strut type radiator. Key to diagrams:—A, manifold; B, strut; C, partition dividing the manifold; E, D, inlet and outlet pipes; F, cooling system; G, water inlet and outlet arrangement; H, collector for the outlet of water and air; I, cross-piece; J, bridle attachment; K, drain plug. Dimensions in millimeters

the water, *D* and *E*, are fixed to the end of the manifold (above or beneath according to the position of the radiator) and can be streamlined by a fairing extending from the manifold. The fins *F* are welded on the manifold so that their plan coincides with the line of flight. They communicate with the manifold by pressed parts *G*. The cross-members *H* allow emptying of the water and evacuation of the air for refilling.

The extreme elements form solid bearings which serve to strengthen the unit. The radiator is easily mounted on the spar by means of suitable bolts, ties and fittings.

The water circulation in the segments is in the form of a loop. The partitions of these segments are connected by riveted and welded bands; their section is brought to its definite form by forced draft of compressed air.

As compared with the 1922 model, the 1924 model offers several important advantages. In the first place, parasite resistance is greatly reduced, not only because of the excellent streamlined form of the radiator, but also because of the relatively large separation and smaller width of the fins. Besides, the weight of the unit itself and of the water contents is reduced about 40 per cent, that is, in the same proportion as the radiating surface. Nevertheless, the radiating capacity has remained the same as before, which is due in the first place to the fact that the radiating surface is not only wholly surrounded by a high speed air stream, but also because this air stream can flow off without any turbulence.

The interchangeability of parts and general accessibility for mounting the radiator on struts, and for repairs and replacements are furthermore very valuable features of this radiator.

American World Flight

After having been missing since April 30, when they took off from Chignik heading for Dutch Harbor, Maj. Frederick L. Martin and Sergt. Alva L. Harvey reported by radio to General Patrick, Chief of Air Service on May 10 that they had safely arrived at Port Moller, an isolated point on the Bering Sea shore of the Alaskan Peninsula. Major Martin's report reads as follows:

"Crashed against mountain in fog at 12:30 a. m. Neither hurt, but ship total wreck. Our existence due to concentrated food and nerve. Arrived at a trapper's cabin, southernmost point of Port Moller Bay, morning of 7th, exhausted. Found food. Rested three days. Walked to beach. Awaiting instructions here."

The report was sent from the Army radio station at Port Moller, which is about 130 mi. in airline distance from Chignik, to Dutch Harbor, and was relayed from there by the naval communication service via Hawaii to Washington. The news of the missing airmen's arrival was first reported in a dispatch to the Navy Department from the Commander of the Coast Guard patrol force in Alaskan waters, who reported the two men in good health.

General Patrick, after a conference with the Secretary of War, sent this telegram to Major Martin:

"We rejoice and thank God that you are both safe and well. Confidence in you unabated. You have proved yourself. Still want you to command flight. Cannot arrange for you to overtake others by going West. You and Sergeant Harvey will report to me here without delay. Plan to send you East to rejoin flight at furthest convenient point from which you can complete the journey with the rest of your command."

Orders have been issued to assemble at Langley Field a new Douglas World Cruiser from the spares available. It is planned to have Major Martin rejoin his command somewhere in Asia, and probably in India.

The three world cruisers now under the acting command of Lieut. Lowell H. Smith flew on May 9 from Nazan to Chicagoff, on the island of Attu, a distance of 530 mi. which they covered in 10 hr. 50 min. This marks the completion of the first of the seven divisions into which the American World Flight of 27,000 mi. is divided. The total distance flown by the planes Chicago, Boston and New Orleans from Santa Monica to Chicagoff is 4,690 mi. which was covered in 61 hr. 53 min. flying time, while the total elapsed time was fifty-four days.

Lieut. Peltier d'Oisy of the French air force, pilot of the Paris to Tokyo flight

The Second Division of the flight leads from Chicagoff to Kashiwabara Bay on the island of Paramushiru, Kuriles, a distance of 860 mi. over the water.

Paris to Tokyo Flight

Lieut. Peltier d'Oisy, pilot, and Sergeant Vésin, mechanic, of the Paris to Tokyo Flight, who arrived at Agra, India, on May 3, flew from there to Calcutta, on May 5. They covered this 850 mi. leg of their long flight in 6½ hr. Their flying time from Paris to Calcutta was 51 hr. 55 min. and the elapsed time for the 6300 mi. distance twelve days.

The severe Indian heat, which deteriorated the fabric of the wings of d'Oisy's Bréguet, has considerably slowed down the Frenchman's progress. One day was spent at Agra to repair the wings, and three days were spent in Calcutta, apparently for the same reason, before the flight was resumed. On May 9 d'Oisy and Vésin hopped off from Calcutta, intending to fly directly to Bangkok, Siam, a distance of 1200 mi. However, when the plane was a hundred miles beyond Rangoon, Burma, the engine became overheated, and as there was no landing field at Mulmein, the nearest town, the pilot returned to Rangoon, where he landed safely in a field among cows and football goal posts. The distance from Calcutta to Rangoon is about 750 mi.

On May 10 the two Frenchmen pushed on to Bangkok, a distance of 500 mi., and on the following day they arrived in Saigon, Indochina, covering the 500 mi. distance of this leg in 6 hr. From Rangoon and Bangkok the flight was difficult because of the intense heat which evaporated the water in the radiator and also caused trouble to the carburation. On the leg from Bangkok to Saigon three storms were encountered which forced the airmen to rise to an altitude of 10,000 ft.

D'Oisy originally planned to fly from Bangkok to Hanoi direct, but he changed his itinerary apparently to avoid flying over the vast virgin forests of Indochina which would have meant a non-stop flight of 800 mi. His total elapsed time from Paris to Saigon was seventeen days, out of which eleven were flying days, for a distance of 7,900 mi.

The remaining stops of the Paris-Tokyo flight are: Hanoi, French Indochina (800 mi.); Canton, China (620 mi.); Shanghai, China (780 mi.); Pekin, China (750 mi.); Haiju, Corea (680 mi.); Tachiarai, Japan (460 mi.); and Tokyo, Japan (560 mi.)

Flying Time of French Air Force

Pilots of the French army air service flew in 1923 a total of 156,684 hr. as against 122,930 hr. in 1922 ,and 104,439 hr. in 1921. The aggregate distance covered was approximately 12,600,000 mi. in 1923, 10,000,000 mi. in 1922, and 8,370,000 mi. in 1921.

LIGHT PLANES AND GLIDERS

Edited by Edmund T. Allen

Interest in Light Planes Grows

Were anything needed to illustrate the remarkable growth of interest in American flying circles regarding the light plane, the numerous letters AVIATION receives on this subject would be illuminating to the most skeptical. Below are reprinted two interesting communications dealing with this subject.

Editor, AVIATION:—

We are prompted to commend your acumen in adding the "Light Planes and Gliders" department to AVIATION, and to congratulate you upon securing Edmund T. Allen to "pilot" the destinies of said particular line of aviation news. We look forward to his observations—and feel safe in prophesying that they will win such justification that you will soon find it expedient to give him more space in the magazine.

His most recent article (April 14) suggesting a design that would be "not a mere speed freak," but possess the all-round qualities of low-landing speed, quick climb, and large speed range, coupled with the suggestion for competitive performance in the way of cross-country flying, with sealed tanks which would demonstrate economy, show the proper conception of what a light plane should in fact consist of.

If our opinion is acceptable, we would merely qualify more definitely, some of the aforesaid features. We would say, for instance, instead of quick climb—ceiling. Maximum altitude at the expense of time, would be a quality preferable to quick climbing. It might be argued that each of these qualities involve the desideratum of surplus horsepower, but maximum altitude can best be attained with lightly loaded wings, a feature in itself best suited to a practical type of light plane. Also, instead of a race between, say, Dayton and Detroit, we would favor a real cross-country race making a circuit covering six or more cities—involving six or more landings. The "landing-without-cracking-up" quality, more than any other, will characterize the successful and practical airplane of the future, light or heavy. Besides, prizes contributed by each of the "control" cities chosen, might easily make an aggregate that would prove a real spur to designers, builders and pilots.

We frankly admit we submit these ideas with an ulterior motive. We have designed, and are getting under way to produce, what we will call the Blondin-Linnet, (Linnet: habitat, Western U. S.), a machine we confidently expect will meet all practical requirements of a safe, cross-country touring light plane.

We solicit no free advertising; we do suggest however, that if Mr. Allen continues to put forward the ideas in question, they may spur some promoter to action, revive the prize-giving spirit of "the good old days," revive also the manufacturers of engines, accessories, and 'planes, whose sole ideal will *not* be Government contracts, and whose number therefore will prove the best—most dependable, support for magazines like AVIATION. Speed the day!

JOSEPH A. BLONDIN
Los Angeles

* * *

Editor, AVIATION:—

I want to write an open letter to Captain Rickenbacker on the subject of his trophy rules. As I am building for the definite purpose of competing in the Dayton light plane events and some of the other events. and would be glad to compete for this trophy under suitable conditions, I am naturally interested in seeing the rules drawn up allow of the greatest degree of fairness to all contestants, including myself.

The fact is I started to build a light plane designed for the highest economy and practical utility, and this was entered, but did not appear in the On-to-St. Louis event. It would be impossible under ordinary conditions, even if the performance was all that could be hoped for from the design, to win any event at St. Louis or at Dayton this year or under the proposed Rickenbacker rules.

The new entries which are hoped to be ready for Dayton are designed for the purpose of winning *speed* races if the same can be done without going to extremes of design. The efficiency matter is purely a delusion in the light plane event, for the reason that no speed airplane can win both the speed *and* efficiency unless by luck all the contestants are very close in their speed and the winner "just happens" to use less gas in relation to other contestants.

Captain Rickenbacker has made a similar mistake to the Dayton efficiency rules, but he has made this mistake in exactly the opposite direction, for the reason that neither he nor Dayton has made any suitable allowance for relative speed. He has placed the greatest premium on the *slowest* possible speed at which any airfoil can be used in its best angle. He has also placed a very high premium on an unsafe or dangerous tendency, which under his proposed rules is to use the *smallest* possible power that will carry the weight specified, with no reserve whatever if such a thing would be possible. In limiting the displacement to 80 cu. in., he has absolutely bared the highest efficiency engine that has enough power for practical purposes.

Captain Rickenbacker's rules, if designed for exclusively, would produce a *slow speed freak* just as surely as the Dayton events will produce a *high speed freak* to win, for no suitable allowance has been made for comparative speed.

It takes eight times the power to drive a definite surface through the air at 100 mi./hr. as it does to drive the same surface through the air at 50 mi./hr.; that is in proportion to the cube of two which is the speed ratio. Therefore, if we take the proportion of the cube of the speed divided by the power, we have a figure of merit which gives an equal chance to any speed airplane. Figure it out at any speed from 50 mi./hr. or 250 mi./hr., and if other things are equal the figure of merit will be the same.

What is a fair equivalent of power? Cylinder size? Absolutely not. Gasoline? Certainly. All engines use gasoline in almost direct proportion to their developed power depending only on the relative efficiency of the engine.

Therefore, the proportion of "the cube of the speed divided by the gasoline consumption" gives a proportion which can be beat only by a more efficient airplane or a more efficient engine.

Mr. Rickenbacker does not produce automobiles to sell transportation on the ton-mile basis, and if he did he could not sell them, so that the development would have no commercial value. I therefore propose to Mr. Rickenbacker as a sporting proposition to frame the rules to "represent the same idea in an airplane, which the Rickenbacker car represents in an automobile;" and what is more I propose to spend a great deal more money and time in proportion to my resources in competing for this trophy than what the trophy represents to Mr. Rickenbacker in proportion to his resources.

I would raise the limit on displacement to 510 cu. in., in order to have a grand free-for-all contest open to any contender in order to allow everybody to come in within a reasonable size, and then I would forget the size. Increased power carries its own penalty in increased gasoline consumption.

I would have the race run over a more or less circular fixed course, in order that the faster contestants would not have any advantage due to the relative wind velocity, a certain distance. I would have also some kind of a figure of merit or points credit, based on the number of man-minutes which

it takes to disassemble, pass through the 8 ft. opening and reassemble and get ready for actual flight of the airplane. Thus, two men taking one hour for this performance would be 120 man minutes.

Pilots should be required to make up to a certain weight with ballast, which I would put at 170 lb. in order that all may be on an even footing.

The formula of efficiency would then be:

$$\frac{\text{Total weight of pilot \& Plane}}{\text{Gasoline}} \times \frac{\text{Speed}^2}{\text{Gasoline}} \text{ plus points for man minutes on assembling test.}$$

That is: a certain total weight is carried over the course, with a certain amount of gasoline, to which a correction is added based on the relative speed and some points added for the practical utility of quick assembly.

The light small airplane figures pretty close to the 250 mi./hr. racer in this kind of an efficiency contest, but I believe myself the light planes will win. Anyway I would like to try it with an engine that actually develops or is intended to develop 40 hp.

H. H. WIXON

Chicago, April 24

P. S. I would like to hear from any readers of AVIATION as to their opinion on the formula, as I believe constructive criticism will help those who will offer trophies or prizes for efficiency. The formula gives a high figure which might be improved by dividing by one million to get within easy figures.

Tour de France des Avionnettes

The French light plane competition this year is to take the form of a cross country race. The circuit is similar to that used in the races in other classes of aircraft, a complete circle of France with landings required at all the large cities on the route. July 24 to 26 has been announced as the date of the event. Both single seaters and two seaters are admitted as entrants, the single seaters with engines of 2000 cubic centimeters (122 cu. in.) and the two seaters with engines of 3000 cubic centimeters (183 cu. in.) displacement.

The difference between this event and the British Air Ministry Competition will appear striking to the casual reader because of the great variation in engine size in the two meets. The British Air Ministry requires two seaters to be equipped with engines of 1000 cubic centimeters displacement or under. It must not, however, be overlooked that the French competition is a far more strenuous ordeal than the British Competition.

A cross country race is a very different sort of proposition as a demonstration of the usefulness of aircraft, than a competition held over a single flying field. The British requirements are exceedingly high, and undoubtedly very high aerodynamic efficiencies will be obtained in the machines entered. They must be high to fly at all under the conditions demanded. But it is very doubtful if any lengthy cross country flights would be attempted in two seaters with 61 cu. in engines. In fact, the British officials do not expect to use the machines with such small engines. It is believed that by limiting the engine size so radically for the competition, designers will exert themselves more to obtain high efficiency than would be necessary had they larger engines. Later slightly larger engines can replace the tiny ones for greater reliability, and with these cross country flights can be undertaken with safety. One exception must not be overlooked, that is the flight of Alan Cobham from London to Brussels on the DH53 with the 46 cu. in. engine. But this remarkable flight is distinctly the exception.

The French Competition, on the other hand, has an entirely different purpose. The object in view is to develop the small sporting or commercial airplane with a high degree of reliability and usefulness. The work of Barbot on the Dewoitine light plane, which he brought to America and in which he expected to fly from New York to Chicago, convinced the French of the need of greater reliability than seemed to be obtainable in the extremely small engines. They were also made to feel that the large span and area required for securing climb with very low power were a great detriment in landing in small fields and in handling and caring for on the ground. Thus their aim was deflected away from pure efficiency which seemed highly impractical, toward reliability and greater power. If the Tour de France is successfully completed by a fairly large proportion of the entrants, the meet will be considered highly worth while and a different and useful type of light plane will have reached an advanced stage of development.

Not Seven-Ninth of a Horsepower

Recent newspaper dispatches from Germany carried the startling news that a German light plane had successfully flown with pilot and a passenger on board while only using an engine of 7/9 (seven-ninth) hp. The news item was duly reproduced in AVIATION with the mental reservation that very unusual atmospheric conditions must have existed to enable such a machine to fly even 75 mi. in 2 hr. and to climb 3600 ft., as reported.

The latest German aeronautical magazines afford a complete explanation of this seeming mystery. The plane in question did not have an engine of seven-ninth horsepower, but one which originally developed *from 7 to 9 hp.*, and which was boosted to give about 12. The error in transmission evidently occurred from the German custom of using the "shilling mark" (/) to denote "from-to" in the rating of engines, as may be seen from the fact that the BMW engine is frequently referred to in German publications as being of 185/230 hp.

Werner von Langsdorff, the constructor of this plane, has now favored AVIATION with an interesting illustrated description of his product, which will appear in a forthcoming issue.

A Valuable Instrument

As the result of several years work, the Bureau of Standards has developed a new electric telemeter by means of which measurements may be made of strains, forces, displacements, and accelerations, and the results indicated or recorded at some remote point.

This new instrument depends for its operation upon the pressure-resistance characteristic or the corresponding displacement-resistance characteristic of a stack of carbon plates. Difficulties, such as erratic behavior, hysteresis effects, and lack of linear relationship between resistance and displacement have been overcome, so that the instrument has proved satisfactory where earlier devices have failed.

Thus far the telemeter has been used for the following purposes in aeronautical engineering:

(1) Measurement of loads in airplane stay cables during flight;

(2) Measurement of strains in airship girders and bridge members during construction tests;

(3) Tests of airship girders in the laboratory.

The use of this instrument results not only in a great saving of time and effort where a large number of readings are needed, but also enables several classes of measurements to be made, not hitherto obtainable in their true proportions.

D. H. Robertson out of Hospital

The numerous friends of Capt. Douglas H. Robertson, formerly of the Royal Flying Corps, will be glad to hear that he has been discharged from the Atlantic City Hospital after having been confined there thirty-three weeks for treatment.

Captain Robertson suffered a fractured spine and a compound fracture of the foot on Sept. 8, 1923, when a seaplane piloted by Dr. H. Livingston Allen crashed near Atlantic City. The pilot suffered a fractured skull, several bones broken and other injuries, but was discharged from the hospital some time ago. Captain Robertson, though not fully recovered, is doing fairly well.

AIRPORTS AND AIRWAYS

Long Island News

Fred Golder, manager of the Curtiss Metropolitan Aeroplane Co., which operates exclusively seaplanes from its stations at Port Washington, L. I., and Palm Beach, Fla., reports a remarkable flight made recently by one of the Company's flying boats.

After the Southern season was over, a Seagull which the Company had been operating at Palm Beach for the last four years was sold to Frank A. McBrien of Elgin, Ill. As McBrien has had more experience on land machines than on seaplanes, it was agreed that Clifford Webster, veteran pilot of the Company, should fly the ship to Elgin. It is over 2000 mi. from Palm Beach to Elgin, and it was planned to make the trip in seven days.

The first day's flight was right across Florida, following the canal to Lake Okeechobee, and then to Calochahachee to the West coast. The flight across Florida has only been done a few times, and is rather dangerous as the water ways are narrow and are often obstructed by overhanging trees. The first night was spent at Cedar Keys, a little way above Fort Myers. The next day a stop was made at Pensacola, and New Orleans was reached just before dark, as the flight was delayed on account of rain and fog. During the ensuing flight up the Mississippi stops were made at Natchez, Cape Girardeau and St. Louis. On the seventh day of the trip, as per schedule, the Seagull flew up the Missouri, branched off at the Fox River and landed at Elgin.

According to Pilot Webster, the Curtiss K6 engine did not miss once during the whole trip, and not even a spark plug was changed. This is quite remarkable as the motor had already had 600 hr. when the flight was undertaken. The total flying time for the trip from Palm Beach to Elgin was 32 hr. 46 min., and only 337 gal. of gasoline was used.

* * *

The Loening Air Yacht belonging to Harold S. Vanderbilt was put in commission on May 2 for its third flying season. Mr. Vanderbilt made a flight on that day from Port Washington to Southampton.

Philadelphia News

The Essington Aviation School (formerly Chandler Field) shows the usual spring activity. J. A. Larsen's new combination land and seaplane is ready for trial. R. M. Hollingshead, Jr., is very anxious to get going in his seaplane, the Elsa.

The only Dornier Dolphin in the United States is to be set up and flown on the Great Lakes by H. V. Shebat of the Syracuse Air Lines, this company having recently bought this plane here.

Charles Walber's Curtiss boat is being set up in preparation for the annual Lu-Lu Yacht Club races during June. George F. Shaw, the winner of last year's race, is sure of duplicating the feat with his Blue Bird.

An inspection of this station was recently made by several Naval Officers with prospects of operating a Naval Reserve training school here for the Fourth Naval District.

An American Aircraft in Europe

The presence of an American aircraft in Europe is still enough of a novelty to warrant mention, and when the ship is piloted by a girl, the occurrence naturally deserves special mention. This is the case of Miss Eleanor Vrendenburgh of Freehold, N. J. who has been touring the French and Italian Riviera last winter in a Curtiss MF flying boat with OXX engine of which she is the owner and chief pilot. Capt. Paul Micelli, formerly of the Lafayette Flying Corps, who taught Miss Vrendenburgh to fly last summer, accompanies her on these flights in capacity of assistant pilot.

As no civil aircraft may fly in France or in any country signatory to the International Convention without having an airworthiness certificate and a registration mark, it is interesting to note that Miss Vrendenburgh's plane bears the registration mark N-ERVA—which may be a subtle tribute to her accomplishments. Miss Vrendenburgh is expected back in this country sometime this month.

Results of National Balloon Race

The Contest Committee, N.A.A. communicates the official results of the National Elimination Balloon Race held at San Antonio, Tex. April 23, as follows:

NATIONAL ELIMINATION BALLOON RACE

Pilot	*Aide*	*Point of Landing*	*Distance*
W. T. Van Orman (Goodyear)	C. K. Wollam	5 mi. N. of Rochester, Minn. Olmsted Co.	1072 mi.
Duration: 44 hr. 4 min. 44.6 sec.			
H. E. Honeywell, (Kansas City)	Capt. T. E. Boudinet	5 mi. S.E. of Sanborn, Minn. Redwood Co.	1042 "
Duration: 39 hr. 11 min.			
Maj. N. W. Peek, A. S. (U. S. Army)	Lt. Wm. A. Gray	5 mi. S. of St. Ansgar, Iowa, Mitchell Co.	1021 "
Duration: 32 hr. 27 min. 15 sec.			
Herbert V. Thaden (Aircraft Development Corporation)	S. A. U. Rasmussen	5 mi. S.-S.W. of Dubuque, Iowa, Dubuque Co.	1003 "
Duration: 34 hr. 8 min. 26.2 sec.			
Capt. Edmund W. Hill, A.S. (U. S. Army)	Lt. G. F. Powell	2 mi. W. of Moline, Kans. Elk Co.	565 "
Duration: 25 hr. 20 min. 20 sec.			
B. H. Fournier (San Antonio)		Kaw, Okla. Kay Co.	517 "
Duration: 18 hr. 7 min. 32 sec.			
Lt. A. C. McKinley, A.S. (U. S. Army)	Lt. L. A. Larsen	Parket Farm, Wapanuka, Okla. Johnston Co.	365 "
Duration: 16 hr. 46 min.			

Our Records are Slipping

The Contest Committee, N.A.A. is in receipt of official notice from the International Aeronautical Federation that new world records have been homologated as follows:

Class C—With 500 kilograms useful load altitude—(Argentine) Otto Ballod, Fokker C4,
Napier-Lyon 450 hp. at El Palomar Field,
Buenos Ayres, Jan. 19, 1924 ..... 6,485 m.
21,276 ft.

Class C1 seaplane—With 100 kg. useful load altitude—(France) Master Mechanician René,
Farman-Goliath Seaplane, 2 Salmson 260
hp., at St. Raphael, April 4, 1924 ..... 3,353 m.
11,000 ft.

Since the new altitude record with 1000 kg. useful load exceeds the former world record held by Lieut. R. L. Fuller, U.S.N., with 500 kg. useful load, a new record is credited in this category in accordance with Art. 198 of the F.A.I. regulations.

Italy Exports Airship Equipment

The Italian government airship factory near Rome recently shipped to Spain a large consignment of airship equipment which included several envelopes for the SCA type airship. An O type airship, purchased by the Argentine naval air service, was shipped at the same time from Genoa to Buenos Aires. The Argentine naval air service already owns an O type airship, which it uses for instruction purposes, and it is understood that the purchase of several larger airships is now being contemplated.

Dayton News

By Maurice C. Hutton

Four remarkable flights testing the new earth inductor compass and other navigation devices developed by the Instrument Branch at McCook Field, were made during the last few weeks. The most important was a trip accomplished in five hops from Dayton to San Antonio, Tex., and return by Lieut. E. H. Barksdale, test pilot, and Navigator Victor Showalter.

These fliers hopped off March 27 for Kansas City, Mo., bucking a strong headwind. Engine trouble caused them to stop at Scott Field, Belleville, Ill., where they were delayed two days. On March 29 they went on to Kansas City and prepared for a non-stop jump to San Antonio, 710 mi. away. Guided solely by their compass, the aviators started from Kansas City on March 30 and completed the trip in 6 hr. 50 min.

After seevral days at the Texas station during which time Mr. Showalter lectured on the application of the new instruments to aerial navigation, the fliers resumed their journey and landed at Muskogee, Okla. They followed a bee-line course above the clouds from there to Dayton, rounding out a trip of about 2,385 mi.

The second flight was made a week later by Lieut. H. C. Downey, of the War Plans section, McCook Field, and Navigator Bradley Jones, from Dayton to Albany, N. Y., a distance of 570 mi. This flight was made without a map or the use of landmarks as the regular map of the terrain was carried in a sealed packet to be opened only in case of emergency. The airmen landed on the Quentin Roosevelt Field at Albany which is situated in the middle of the Hudson River. Lieutenant Downey reported that the field was one of the best municipal landing places he had ever seen and recommended it heartily to aviators flying in that district.

Before these fliers returned from New York, Lieutenant Barksdale and Navigator MacShort rigged up an inductor compass in an Airways DH and skipped up to Cleveland, approximately 200 mi. from Dayton, in 1 hr. 20 min. They were aided by a 65 mi./hr. gale on their tail.

* * *

Maj. Henry C. K. Muhlenberg, formerly of Dayton, and Maj. Herbert A. Dargue, both of the commander and general staff school at Fort Leavenworth, Kans., were visitors at McCook Field en route to Washington. They flew in from Chicago.

* * *

John Ahlers, Chairman of the Membership Committee of the N.A.A., announced that the national membership campaign being conducted by Admiral William F. Fullam, retired, will be resumed within a few weeks in the West. The new itinerary includes Minneapolis, probable site of the 1925 International Air Races, St. Louis, Kansas City, Davenport, Oklahoma City, St. Joseph, Wichita, Denver and Omaha.

Mr. Ahlers, who was a member of the membership party that toured the South recently, reported that chapters were formed in each of the fifteen cities visited.

Davenport News

By Ralph W. Cram

A fast flight was recently made from Lincoln, Neb., to Wallace Field, Bettendorf, Iowa, when two Lincoln-Standard planes carrying six air travellers made the trip at an average speed of 150 mi./hr. with a favoring wind.

In the party were Ray Page, president of the Lincoln Standard Aircraft Corp., Christian E. Lund, H. C. Houghton and M. A. Sine of Chicago, purchasers of the two planes, and Eyer Sloniger and Evald G. Bahl, pilots. The planes were being delivered to the field which Mr. Lund and his associates have opened at Chicago, on Higgins road just south of Park Ridge. There they have 85 acres, giving a landing space 1,200 x 1,700 ft., of L shape, and expect to do a general commercial flying business.

The two planes took the air the same day for Chicago where they arrived in 1 hr. 40 min. flying time, thus making the entire trip of 600 mi. in 5 hr. 20 min. flying time.

The Lincoln company's new LS5 plane is admirably adapted to this, carrying four passengers and a pilot. The passenger's cockpit is handsomely upholstered in leather and offers very comfortable places for four. The plane is powered with a 180 hp. Hispano and is recognized as a very practical commercial job.

The Lincoln company reports orders in sight that give it very good prospects for its best business this year. Last year twelve of its planes went to Mexico and two to Honduras. In Mexico they were used for payroll transportation on account of the greater safety afforded by air transport against holdups as compared to road transport.

Pilot Bahl was in Honduras with the other two planes. There he made sixty round trips from the coast to Tegucigalpa, the capital, carrying passengers who in a couple of hours made the 150 mi. which otherwise took five days by mule and other means of travel over the mountains. He thus traveled some 18,000 mi. over mountain country without an accident. When the revolution broke out he was offered a small fortune to drop bombs on the capital, but preferred to sell the planes and come back to the states.

Mail Pilots' Flying Time

The amount of flying done by the U. S. Air Mail Service is strikingly illustrated by the following table, which gives the Air Mail pilots' flying time and aggregate mileage as up to Feb. 29, 1924:

Name	*hr.*	*min.*	*Miles*	*Headquarters*
Allison, E. M.	1,790	09	162,811½	North Platte, Neb.
Ames, C. H.	892	13	85,158	Cleveland, Ohio
Bishop, L. F.	1,039	18	93,441	Salt Lake City
Barker, Hugh	44	10	3,835	Salt Lake City
Blanchfield, Wm. M.	1,404	22	133,460	Reno, Nev.
Boonstra, H. G.	1,210	24	108,254	Rock Springs, Wyo.
Burnside, Frank H.	93	05	8,273	Maywood, Ill.
Chandler, H. A.	1,761	10	154,830	Cheyenne, Wyo.
Collins, P. F.	1,340	50	129,613	Cleveland, Ohio
Collison, H. A.	1,526	34	140,419½	Rock Springs, Wyo.
Ellis, R. H.	1,759	34	156,860	Salt Lake City
Garrison, L. H.	1,883	47	169,152	Omaha, Neb.
Hopson, W. C.	2,127	22	210,381	Omaha, Neb.
Huking, H. W.	1,600	49	139,024	San Francisco
Johnson, C. E.	1,301	04	125,366	Hempstead, N. Y.
Knight, J. H.	2,179	06	197,571	Omaha, Neb.
Lange, C. C.	1,340	03	122,606	Omaha, Neb.
Lee, E. H.	2,271	00	189,616	Maywood, Ill.
Levisee, R. B.	1,389	05	127,673	Reno, Nev.
Lewis, H. T.	1,769	18	162,842	Omaha, Neb.
Marshall, Tex.	1,771	38	154,832	Maywood, Ill.
Mouton, E. E.	1,964	24	184,384	Reno, Nev.
Murray, J. P.	2,112	52	187,641	Cheyenne, Wyo.
Myers, G. I.	349	26	34,538	Maywood, Ill.
Page, R. G.	954	36	77,622	Maywood, Ill.
*Pearson, B. H.	390	32	37,678	Cleveland, Ohio
Scott, P. P.	1,680	24	149,792	Salt Lake City
Sharpnack, J. W.	560	07	51,183	Salt Lake City
Short, S. J.	470	16	45,614	Maywood, Ill.
Smith, Art.	489	02	47,932	Cleveland, Ohio
Smith, D. C.	1,732	30	159,561½	Hempstead, N. Y.
Smith, H. G.	1,884	07	175,494	Omaha, Neb.
Smith, W. L.	1,938	06	178,331	Hempstead, N. Y.
Unger, K. R.	1,386	53	136,866	Salt Lake City
Vance, C. K.	1,222	57	119,260	San Francisco
Wagner, R. L.	401	04	38,874	Omaha, Neb.
Ward, E. F.	38	18	3,925	Cleveland, Ohio
White, E. F.	621	56	57,453	North Platte, Neb.
Williams, W. D.	1,944	33	178,789	Cleveland, Ohio
Winslow, B. H.	1,280	49	113,349	San Francisco
Yager, F. R.	1,978	52	182,125	Cheyenne, Wyo.

*Killed in flight March 7, 1924.

Instruments for Direct Course Flying

A compass, by itself, is of little value when flying in clouds or at night, as it is practically impossible for a pilot to hold his ship on a straight course, and a compass will only indicate correctly during straight flight or on very slow turns. By using a turn indicator, which shows the slightest divergence from straight flight, the pilot avoids turning, and his compass will function properly. A straight course is maintained by steering so as to keep the indicator in the central position. Used in conjunction with the bank indicator, the pilot is able to maintain a laterally level attitude while flying straight and to bank at the proper angle when turning.

The Pioneer Turn Indicator, which is used on the airplanes of the Army, Navy and Air Mail, has been developed to its present state of efficiency and reliability through the combined efforts of the Sperry Gyroscope Co., the Lawrence Sperry Aircraft Co. and the Pioneer Instrument Co. The latter company is now the exclusive manufacturer of these instruments, holding licenses under Sperry patents of Feb. 21 and Oct. 24, 1922. The Turn Indicator is also patented in France and Great Britain, and other patent applications are pending.

Illustrated circular will be mailed upon request.

(c) Kadel & Herbert

Lieut. E. M. Powers, A.S., standing in front of the Boeing MB3A pursuit plane in which he made a speed of 174.7 mi./hr. over a 45 mi. course in the air circus at San Antonio, Tex.

A Fast Flight

Nine hours from Seattle, Wash., to San Diego, Calif. by air was the flying time recently made by Lieut. B. H. Wyatt, U.S.N., Lieutenant Wyatt flew a standard Navy DeHaviland plane and covered the 1200 mi. at an average speed of 133 mi./hr., an exceptional performance.

The fast time is attributed to the superior type of airmanship displayed. Lieutenant Wyatt is an experienced meteorologist and was selected as weather forecaster for the proposed Arctic air expedition. He was also successful in obtaining the only photographs of the sun's eclipse made from a Naval plane last September. His knowledge of atmospheric conditions was drawn upon to select a strata of air which would give him a continuously favorable wind over the entire flight. Ascending more than a mile and a half above the earth Wyatt found a wind of 45 mi./hr. blowing to the southward which he used to advantage. The time of the flight represents one fifth of that required to travel from Seattle to San Diego by rail, the best through service requiring 51 hr. One stop was made for refueling at San Francisco.

Test of Water Recovery Apparatus Satisfactory

The first reports from the tests of the water recovery apparatus at the Naval Aircraft Factory at Philadelphia, for use on the airship Shenandoah indicate that as a condenser of the vapor from engine exhaust this apparatus is remarkably successful. At three different air speeds, with the engine upon which the tests were made operating at 150 hp., the recovery of water was about 10 per cent greater than the weight of fuel burned.

The water recovery apparatus will be installed on the engines of the airship Shenandoah to condense the water vapor from the exhausts of the engines. The water recovered will compensate for the loss in weight suffered through the consumption of fuel.

In an airship the maintenance of weight equilibrium is very important, in order to avoid the necessity for releasing some of the helium gas with which the ship is inflated in order to counteract the lightness of the ship caused through the expenditure of fuel. The saving of this gas means a greater operating range for the airship, at less cost.

Naval Air Station, Lakehurst

The Naval Air Station at Lakehurst, N. J., has been furnishing from one to three officers a week as lecturers on aviation subjects before various organizations in the Atlantic and New England States. During the week ending April 12 Comdr. J. H. Klein, Commanding Officer of the station, addressed the Veterans of Foreign Wars at Boston, and Lieut. R. J. Miller addressed a boy's school Forum at Germantown, Pa. The lectures by the officers of the station have done a great deal to develop public interest in the aviation work of the Navy, and particularly the lighter-than-air activities centered at Lakehurst.

Aroostook Back in San Diego

The U.S.S. Aroostook, aircraft tender for the Aircraft Squadrons, Battle Fleet, returned to the Naval Air Station at San Diego, Calif., on April 11. This marks the completion of the participation by those squadrons in the southern maneuvers with the Fleet this winter. The Squadrons left San Diego on the U.S.S. Aroostook, Jason and Gannet about the first of the year. Four squadrons of planes comprised the force from the Aircraft Squadrons Battle Fleet that participated in the maneuvers in the Caribbean this winter.

CALENDAR OF AERONAUTICAL EVENTS

March 25.	Start of the British World Flight, Southampton, England.
April 6.	Start of World Flight of the U. S. Army Air Service, Seattle.
June 3-11.	International Aircraft Expositon, Prague, Czechoslovakia.
June 15.	Gordon Bennett International Balloon Race, Brussels, Belgium.
June 21.	Annual F.A.I. Conference, Paris, France.
June 22.	Commodore Beaumont International Cup Race for high speed airplanes, Istres, France.
July 5-6.	Zenith International Airplane Efficiency Race, Paris, France.
August.	"Tour de France des Avionnettes." International Round-France race for light airplanes.
Oct. 2-4.	International Air Races, incl. Pulitzer Trophy Race, Dayton, Ohio.
Oct. 24-25.	Schneider Cup Race, Baltimore.
Dec. 17.	Twenty-first anniversary of the first successful airplane flight.

UNITED STATES AIR FORCES

U. S. ARMY AIR SERVICE

Enlisted Men Make Long Airplane Flight

A long airplane flight was made early in the year by Staff Sergts. C. F. Colby and T. Joseph Kelly, A.S., stationed at Brooks Field, San Antonio, Tex. These two noncommissioned officers flew from Brooks Field, Tex. to Boston, Mass., and return, covering a total distance of 4118 mi. in a flying time of 49 hr. 15 min.

The route flown over was as follows: San Antonio to Dallas, Tex.; Muskogee, Okla.; Belleville, Ill.; Rantoul, Ill.; Fairfield, Ohio; Moundsville, W. Va.; Washington, D. C.; New York City, and Boston, Mass. On the return trip the fliers retraced their route with the exception that, instead of flying direct from Belleville to Muskogee, a stop was made at Kansas City, Mo.

The report on this flight, rendered by Staff Sergeant Colby, goes into considerable detail on flying conditions encountered en route,—snow, haze, fog, rain, zero temperature, etc. An idea of wind conditions encountered may be gained from the fact that the stretch of 353 mi. from Muskogee to Belleville, was flown in 5 hr., and the distance of 225 mi. from Kansas City to Muskogee on the return trip required 4 hr.

On the outward trip a forced landing was made near Edgar Springs, Mo. due to a leak in the water hose connection. After making the necessary repairs they were forced to remove a portion of a farmyard fence and using full motor and four or five natives under each wing managed to taxi into another field on higher and harder ground and made a successful take off. Radiator trouble was a frequent occurrence until the fliers reached Bolling Field, D. C. on their return trip, where the overflow pipe was disconnected and a new radiator fitting installed. With this adjustment their radiator troubles ended.

Army Air Orders

Maj. Ira Longanecker, Inspector General (A.S.), relieved from detail in Inspector General's department from June 30, to comply with orders March 24, after leave granted.

Orders Jan. 19 amended reading four months' leave to First Lieut. John Y. York, jr., A.S., effective on arrival in New York and terminating in time to enable him report Scott Field by Sept. 15.

Following-named A.S. officers relieved from duty as students at Engineering School, McCook Field, on completion of course, to report for duty by Aug. 15 to C.O., that station: Capts. Edward Laughlin and Leo A. Walton, First Lieuts. Wallace R. Fletcher, George W. Polk and Alexander Pearson, jr.

First Lieut. Burnie R. Dallas, A.S., from duty as student at Engineering School, McCook Field, on completion of course, to duty Office, C.A.S., Washington, by Aug. 15.

Maj. Byron Q. Jones, A.S., appointed to board for study of proposed aerial law for Philippine Islands.

Production at Wilbur Wright Field

During the last half of March the production of airplanes and engines in the Repair Shops at Wilbur Wright Field, Fairfield, Ohio, was maintained at a high level. The following have been reported as completed: 4 DH4B's, 2 DH4B's (Airways), 5 JNS, 8 Liberty engines, 7 Wright I, 2 Wright A and 6 Wright A2. Thus the total for the fifteen-day period was eleven planes and twenty-three engines.

San Antonio Air Depot

During the month of March the Engineering Department of the San Antonio Air Intermediate Depot, Kelly Field, Tex., repaired, remodeled or reconditioned 19 DH4B's, 2 DH4B3's, 1 DH4B1, 3 TMMB3M's, 2 NBS1's, 2 JN6HE's, 1 ambulance plane, 31 Liberty 12A engines and 6 Wright E engines.

Van Veghten's Funeral

First Lieuts. S. M. Connell, Kenneth Garret and James T. Hutchinson flew from Mitchel Field, N. Y. to Mechanicsville, N. Y., on April 12 and sprinkled a floral offering on the new made grave of First Lieut. Theodore S. Van Veghten, A.S., who died as the result of injuries received in an airplane crash at McCook Field, on April 8.

Boeing MB3A Makes High Speed

Flying around a 45 mi. course, Lieut. A. O. Powers, at Kelly Field on April 23 attained a speed of 174.7 mi./hr. on a Boeing MB3A pursuit plane.

U. S. NAVAL AVIATION

Naval Air Stations to Train Reserves

Plans have been practically completed for the advanced training of a large number of student aviators of the Reserve Force at the Naval Air Station at Hampton Roads. Upon completion of their course and if recommended by the Commanding Officer of the Naval Air Station at Hampton Roads and by the Commandant of their Naval District they will be commissioned as Ensigns, Reserve Force, and designated Naval Aviators.

The old Assembly and Repair offices on the station have been turned into a training school. Lieut. Comdr. G. A. Smith, U.S.N., will be officer-in-charge of this training. In addition to the student aviators to be trained at the station, preparations have been made for the training of commissioned officers in the Reserve Force. Forty-five of these officers were trained at Hampton Roads during the past year.

Friday afternoon has been set aside in the Flight Department of the Naval Air Station at San Diego, Calif., for the training of Naval Reserve Aviators. On the first Friday three reserve pilots reported for duty. The pilots will be given the regular training in so far as the limited time permits.

Besides the two above mentioned stations, instruction for Reserve Aviators who are able to reach the stations will be given at all Naval Air Stations.

Naval Air Orders

Lt. (jg) Theodore G. Haff, det. Nav. Air Sta., Pensacola, Fla.; to temp. duty Rec. Barracks, Hampton Roads, Va.

Lt. (jg) William M. Hainer, det. Nav. Air Sta., Pensacola, Fla.; to temp. duty Rec. Barracks, Hampton Roads, Va.

Lt. (jg) Andrew T. Lamore, det. Nav. Air Sta., Pensacola, Fla.; to temp. duty Rec. Barracks, Hampton Roads, Va.

Lt. (jg) Artyn L. Main, det. Nav. Air Sta., Pensacola, Fla.; to temp. duty Rec. Barracks, Hampton Roads, Va.

Lt. (jg) Leo L. Pace, det. Nav. Air Sta., Pensacola, Fla.; to temp. duty Rec. Barracks, Hampton Roads, Va.

Lt. (jg) Gordon A. Patterson, det. Nav. Air Sta., Pensacola, Fla.; to temp. duty Rec. Barracks, Hampton Roads, Va.

Lt. (jg) Bruce Settle, det. Nav. Air Sta., Pensacola, Fla.; to temp. duty Rec. Barracks, Hampton Roads, Va.

Lt. Comdr. Virgil C. Griffin, det. USS Langley; to Nav. Air Sta., Pensacola, Fla.

Lt. Cdr. George W. La Mountain, det. USS Patoka; to USS Sirius.

Gun. Oscar E. Dannegger, det. Sperry Gyroscope Co., Brooklyn, N. Y.; to Navy Yard, New York, N. Y.

Shenandoah Almost Ready

The tailoring, refitting and painting of the outer cover of the rigid airship Shenandoah at the Naval Air Station at Lakehurst, N. J., was 90 per cent completed on April 26. With the exception of some work remaining to be done on the tail fins and walkway, the structural repairs on the ship have been completed. It is expected that the Shenandoah will be ready for flight in the middle of May.

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Proposed Use of the ZR3

When the ZR3 , the rigid airship now being built for the Navy in Germany, is received this fall it will be put in operation to demonstrate that mail can be transported regularly between the United States and Europe. This announcement was made by Secretary of the Navy Curtis D. Wilbur in an address before the annual meeting of the National Security League in New York, May 8.

Secretary Wilbur said: "When the ZR3 is received from Germany it will be tried out to prove whether or not rigid airships are practicable for commercial purposes. We believe that the first field for rigid airships is over the water, and if the Navy can show that mail can be regularly transported between Europe and America in two days or less we will feel that the expenditure for rigid airships will not have been made in vain."

Plane Rescues Crew Adrift in Small Boat

An unaccustomed passenger in an HS2L seaplane from the Naval Air Station at Coco Solo, Canal Zone, nearly expired with fright when touched on the head by the pilot of the plane. He was searching for his vessel, which had been abandoned a short time before, when the pilot of the plane saw the ship and wished to attract his attention to it. The aircraft tender Curlew from that station, with the plane on board, was returning from a surveying trip when word was received that the Silver Star, a small steamer, was adrift at sea. The Curlew located and picked up the owner of the vessel and a mariner in a small boat. The mariner was taken on board the plane as observer, and the ship was located. The plane returned to the Curlew and that vessel proceeded to abandoned ship, which was taken in tow and brought to Colon.

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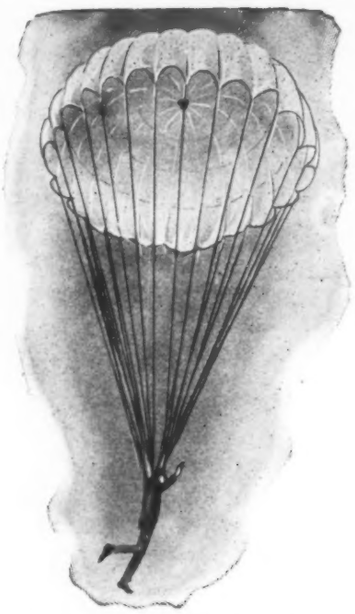

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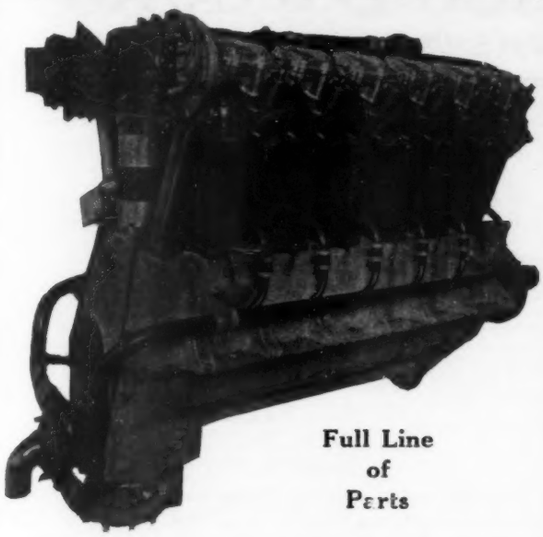

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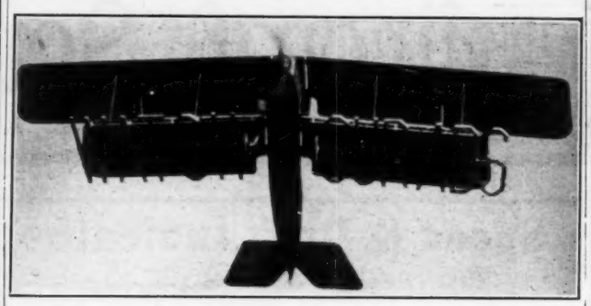

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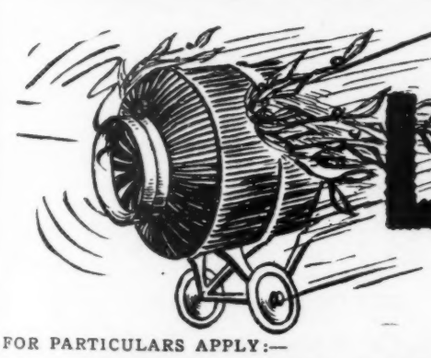

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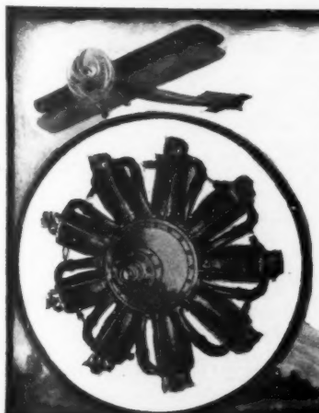

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